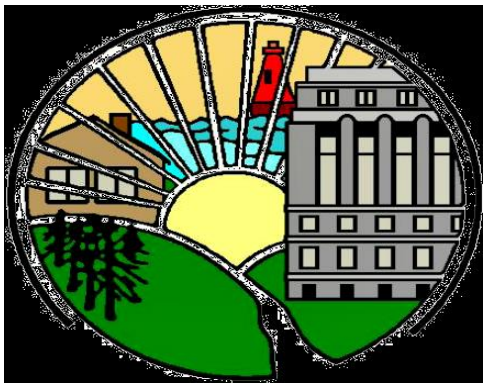
Sheboygan County TB EVENT

AFTER ACTION REPORT/IMPROVEMENT PLAN

February 7, 2014



Public Health
Sheboygan County
Division of Public Health

HANDLING INSTRUCTIONS

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EXECUTIVE SUMMARY

On April 11, 2013, the Sheboygan County Division of Public Health (SCDPH) received a report from a local medical provider of an adult patient with suspected pulmonary tuberculosis (TB). Four days later, laboratory results confirmed a diagnosis of pulmonary tuberculosis. The patient, whom we will subsequently refer to as the Index Case, was foreign born with a large extended family. Laboratory testing of the Index Case's sputum was conducted at the Centers for Disease Control and Prevention (CDC) and the Wisconsin State Lab of Hygiene (WSLH) to determine whether a standard TB treatment regime would be the therapy of choice or if drug resistance was present. First line drug susceptibility testing demonstrated resistance to both Isoniazid and Rifampin indicating the patient's TB disease was multidrug resistant or MDR TB and would require a more difficult and prolonged treatment regime.

During the decade preceding this outbreak (2003-2012), thirteen reports of active TB were reported in Sheboygan County (0-4 cases/year), two of which were found to be MDR TB. From April to mid-May, seven additional cases of TB were identified among extended family members. This rapid flurry of activity early in the outbreak led the local health department to recognize that SCDPH capacity was quickly being strained and the Incident Command Structure (ICS) was activated. (More detail as situations occurred is described in the Significant Events Log, page 8.)

The purpose of this report was to analyze the outbreak response and results from data collected, highlight strengths and identify areas for improvement in an effort to act as a resource for others faced with a similar outbreak. Recommendations for improvement are provided. The following CDC Target Capabilities were selected as focus areas for this event. They include: Emergency Operations Coordination, Emergency Public Information and Warning, Information Sharing, Medical Material Management and Distribution, Non-Pharmaceutical Interventions, Public Health Surveillance and Epidemiological Investigation and Responder Safety and Health.

A variety of evaluation methods were used, and efforts to obtain input and feedback from many people involved with this event were made. Several debriefings were conducted. Written feedback questionnaires were provided to those individuals and agencies involved. The Sheboygan County TB Event After Action Report (AAR) and Improvement Plan (IP) have been completed to help to identify priorities for future plan improvements or developments.

SECTION 1: EVENT OVERVIEW

Event Details

Event Name
Sheboygan County TB Event

Type of Event
TB Outbreak

Event Start Date
April 11, 2013

Event End Date
Event is still ongoing.

Capabilities
- #3: Emergency Operations Coordination
- #4: Emergency Public Information and Warning
- #6: Information Sharing
- #9: Medical Material Management and Distribution
- #11: Non-Pharmaceutical Interventions
- #13: Public Health Surveillance and Epidemiological Investigation
- #14: Responder Safety and Health

Participating Organizations

- ACL Laboratories
- Aurora Sheboygan Clinic
- Aurora Sheboygan Memorial Medical Center
- Aurora Visiting Nurse Association
- Brown County Public Health
- Centers for Disease Control and Prevention (CDC)
    - CDC – Epi Aid
- Children's Hospital of Wisconsin
- City of Sheboygan Fire Department
- City of Sheboygan Police Department
- Division 112 of Wisconsin Mutual Aid Box Alarm System (Incident Management

Team)

- Fond du Lac County Public Health
- Hmong Mutual Assistance Association
- Manitowoc County Public Health
- Mayo Clinic
- National Association of County and City Health Officers (NACCHO)
- National Public Radio (NPR)
- Outagamie County Public Health
- Plymouth Review
- Rocky Knoll Healthcare Facility
- Sheboygan Area School District
    - Farnsworth Middle School
    - Horace Mann Middle School
    - Marketing & Communications
    - Nursing Staff
    - South High School
    - Superintendent
    - Wilson Elementary School
- Sheboygan County Administrator
- Sheboygan County Emergency Management
- Sheboygan County Finance Department & Information Systems
- Sheboygan County Health & Human Services
    - Aging and Disability Resource Center
    - Division of Community Programs
    - Division of Economic Support
    - Division of Public Health
    - Division of Social Services
- Sheboygan County Human Resources
- Sheboygan County Planning and Conservation

- Sheboygan Press
- St. Nicholas Hospital
- United Way 2-1-1
- Wisconsin Department of Health Services
    - Communications Department
    - North East Regional Office
    - TB Program

SIGNIFICANT EVENTS LOG:

Time	Event/Action
4/11/13	Event Begins
4/23/13	Incident Command Structure (ICS) activated
4/24-30/13	Joint plans/ press conference made with Sheboygan Area School District
5/6/13	Lab reports confirm index case is MDR-TB (Multi Drug Resistant – TB)
5/7/13	ICS is expanded
5/8/13	Conference call with CDC, State TB Program, local schools, medical reps
5/9/13	Letters sent home to parents of South High and Horace Mann Middle school. Environmental evaluations conducted at worksites.
5/10/13	Index case hospitalized. Meeting with Aurora Sheboygan Medical Center.
5/13/13	Emergency Management Director brought on board. Restructured ICS. Conference call placed for mutual aid, State & Regional assistance.
5/14/13	Incident Management Team (IMT) arrived. Five households now affected. Computer Aided Dispatch flagged these addresses for law enforcement/fire to wear Personal Protection Equipment (PPE).
5/15/13	Mutual aid arrived from CDC, State, Regional, Local offices. Meeting with Mayor. Isolation signs posted on homes of active cases.
5/16/13	Emergency Operations Center (EOC) opened. IMT develops first Incident Action Plan (IAP). Discussed declaring “state of public health emergency.”
5/17/13	Conference call with State – decided not to declare State of Emergency
5/20/13	Conference call with State Legislature – requesting appropriations through Joint Finance
5/22/13	Meeting with Human Resources - work out details to hiring LTE staff.
5/24/13	Staff started fit testing with half face masks. Media plan developed addressing State funding.
5/28/13	Results of 50 T-spots returned - no positives. Case Count @ 8. CDC Epi-Aid Team arrives
5/31/13	Conference call with Mayo. Finance meeting – to obtain housing for index case. Working to expand State TB Dispensary contract with hospitals & clinics.
6/3/13	Press statement from Governor in support of funding – lead story in local press and TV
6/4/13	Updated press release sent to Local and Regional media. Joint Finance Committee approved 4.6 million dollars in State biennial budget.
6/11/13	Final drug susceptibility showed 1 MDR-TB and 7 INH resistant clients
6/12/13	Three adults with active disease (employed at local businesses) are released from isolation
Late June-August 2013	Additional active cases identified
7/17/13	Local physician, State TB Program staff and Sheboygan County PHNs conduct case review of 41 contacts for LTBI treatment
8/14-21/13	Efforts in place to coordinate administration of directly observed therapy (DOT) by school staff
9/4/13	Due to retirement, a new Incident Commander assumes that position
9/11/13	Two nurses assigned to manage the Med Room process and ordering medications
Oct-Dec. 2013	DOT continuing. Some clients – DOT is ending. Index case released from isolation

SECTION 2: STRENGTHS AND AREAS FOR IMPROVEMENT

The purpose of this report was to analyze data collected through various methods that included two "hot wash" debriefings. The initial debriefing focused on the Section Chiefs and several Local, Regional and State partner agencies involved in the TB event. A second hot wash debriefing included the case managers, public health nurses, State TB Program representatives and various support staff. A feedback survey was sent to partner agencies that did not participate in the debriefings. As part of the AAR/IP process, this report will assist in updating the Sheboygan County's Public Health Emergency Plans (PHEP).

Target Capability #3: Emergency Operations Coordination

Observations:

SCDPH utilized the Incident Command System (ICS) early on in this event. Several revisions of the ICS structure were made throughout the event. The final version identified the Finance Chief, the expanded case management process and logistics section (see Appendix A). As the event began to unfold, the staff assigned to the "Chiefs" level of the ICS, began to clarify the roles and responsibilities of their sections. Within three weeks of ICS implementation, the case count had escalated to eight. Significant communications occurred with health care partners and several joint press conferences with the Sheboygan Area School District were conducted.

It was at this point that the Emergency Management Director was brought in. The Emergency Management Director was instrumental in identifying the need to bring in assistance to help the SCDPH provide structure and documentation to the event response. On May 14, 2013, the MABAS Division 112 Incident Management Team arrived at the Emergency Operations Center (EOC). The first Incident Action Plan (IAP) was drafted. Daily planning and operational briefings were conducted that eventually included Finance and Purchasing. Administrative meetings were conducted to open channels for additional county assistance. The State of Wisconsin also opened their EOC. Initially, both the State and Sheboygan County were developing "Situation Reports." Eventually, one Situation Report was developed to incorporate the response from the Local and State level.

SCDPH collaborated with the State TB Program. The State TB Program provides medication and educational services to prevent and control infection caused by mycobacterium tuberculosis. They were instrumental in miminizing financial barriers to evaluation and treatment of cases and contacts. SCDPH also began requesting mutual aid and seeking LTE staff. Laboratory analysis of specimens from the Index case indicated she had two strains of TB; the second strain was not shared by the rest of the active cases. As a result, medical directive addressed the need for separate housing of the MDR TB index case from family members with INH only resistant cases. The Logistics branch was tasked with locating suitable housing and supplies.

Strength:

The SCDPH staff had completed prior emergency preparedness planning, training and exercising which provided the basic knowledge to implement the ICS. Staff was already aware of what roles and responsibilities they may be tasked with during the event. Strength was bringing in the Emergency Management Director. He was quick to recognize this escalating situation and the need for more structure. The Incident Management Team was brought in and developed the first Incident Action Plan (IAP) of the event. Through their guidance, formal meetings such as planning and operations were implemented. ICS forms were utilized to begin tracking the daily operations of staff. The State TB Dispensary Program provided the necessary financial assistance for client medication as well as health care provider visits, laboratory testing and x-rays for those who were un/underinsured through a pre-established TB Dispensary Program with the local health department.

Areas for Improvement:

While most of the public health staff assigned to the "Chief" roles were familiar with the ICS, not all assisting staff understood how their positions tied into the ICS chart. Supporting staff were assigned roles but were not given clarity as their positions related to the overall event.

Often the Finance branch of ICS is mentioned but rarely included in trainings or exercises. This proved to be a misstep as it became obvious that Finance/ Accounting had a very large role in this event. The Finance staff were new to the ICS structure. It also was evident that they should have been brought in much earlier into the response. As the event continued, the ICS roles began to exceed the span of control. The Operations Chief also took the lead on the case contact investigations and in early September also assumed the role of Incident Commander, as well as maintaining programming responsibilities beyond the event.

Nursing staff, including case managers, had individual communications with health care partners, Mayo Clinic and the State TB Program staff. However, a hospital/clinic liaison was not present for the EOC Planning or Operations meetings. The event may have benefited from health care partner representation at the briefings. While it is difficult to determine the trigger that escalates an event, early representation is best.

Target Capability #4: Emergency Public Information & Warning

Observations:

The SCDPH ICS chart had identified a Public Information Officer (PIO). This person was knowledgeable of the role and had prior training for the position. There was not a backup PIO identified on the ICS chart. The State of Wisconsin provided a representative to assist with crafting messages. She also provided assurance and guidance to help foster a calming

atmosphere. Approximately one week after the first identified case, joint communication plans were initiated. Staff at Sheboygan South High School were presented with a situation report. Letters were sent home to alert the parents. Contacts were made to the local newspaper and local radio affiliates. The joint media conferences were well planned and went smoothly.

Several of the active cases were employees of three local businesses. In early May, the businesses were informed of the situation. The SCDPH obtained assistance from the CDC to provide the necessary resources to conduct environmental assessments at the worksites.

A concern of the businesses was keeping the company name "out of the news." The SCDPH took great precautions to maintain the confidentiality of the affected families and businesses. As word of the TB event spread in the news, local and nationwide attention began to surface.

Some of the media sites included:

- Sheboygan Press
- WHBL – Sheboygan News Station
- Plymouth Review
- WTMJ Channel 4
- WFRV Channel 5
- WITI Channel 6
- WISN Channel 12
- WDJT Channel 58
- Wisconsin State Journal
- NACCHO (National Association of County and City Health Officers)
- Cited on CSPAN (Cable Satellite Public Affairs Network)
- National Public Radio (NPR)

Partner agencies pointed to the good collaboration. There was a concerted effort to provide media releases with SCDPH as a lead. The situation was handled professionally with organized meetings and timely updates. However, this event has identified the need for continuing education in the community as reflected by some outside situations. One client indicated his temporary employment position was affected by this event. Some of the school students expressed being treated differently upon return to school.

Strengths:

Overall, the Sheboygan County PIO and joint communication team did an excellent job with messaging. They built upon existing relationships with partner agencies and stakeholders. They conveyed clear and concise messages. Confidentiality of the clients and businesses was maintained. Once a more unified system was in place, certain nursing staff were designated to take calls from community, schools and businesses. Information was shared in a proactive rather than reactionary manner.

Areas for Improvement:

While the Sheboygan County Public Information Team did an excellent job of narrowing the scope of those needing information, a few exceptions "fell through the cracks." Initially when the TB Event began in April, the middle school was not part of the conferences. Over the summer break one of the elementary school students that transitioned into the middle school, became active. This created additional people to be included in the messaging during a time when it was difficult to contact school staff.

The Sheboygan County Public Information Team should continue to reassess the need for PIO backup, within the SCDPH as well as for county wide events.

Target Capability #6: Information Sharing

Observations:

As the event unfolded, stakeholders began to be identified. The Index Case had several children attending local schools. Staff of one elementary and one high school were included early in the event. The SCDPH followed a model used by the Appleton Health Department. As a result, a team approach was appreciated by all.

The SCDPH recognized the need for an environmental assessment of the business facilities and requested guidance from the State TB Program. The State of Wisconsin did not have a formal procedure. The CDC sent a template model that had been used in New Jersey. The SCDPH received acknowledgement for a successful process.

As the event escalated, this created a surge of activity for the SCDPH as well as local physician offices, hospitals, laboratories and x-ray departments. The surge in activity presented without prior notification. Local health care providers had varying levels of experience working with TB. Differences in testing and treatment recommendations with accompanying differences in policies and protocols presented challenges to both public health and the health care systems.

Lack of a unified process for coordinating communication between the public health nurses and staff of health care agencies caused confusion. Information sharing challenges continued as the public health staff brought problems and issues to the morning updates rather than follow the

ICS chain of command.

The SCDPH receptionists became the "hub" for information sharing. As multiple daily meetings developed, staff were often confused as to which meetings they were to attend. An information board was placed at the reception desk to keep staff informed of meeting specifics including who should attend. The receptionists, having little prior emergency preparedness training, were given a crash course in the use of Esponder. They became a valuable asset for managing the event calendar and document posting on Esponder. As a result of this event, they developed a list of tasks and duties they performed. A Job Action Sheet was created to capture and identify those tasks for future reference.

As the event spread to extended family members, living in multiple households, it became a challenge to track the outbreak and manage pertinent data. A family map was developed (see Appendix B).

The State TB Program staff continued to be an integral partner in the event. Staff at the SCDPH relied on the State or the Sheboygan Area School District (SASD) to set up teleconferences with State, Regional and National representatives, as they had the capability to do so. Regular situational updates were shared with public health staff.

Strength:

The SCDPH has a long established trust with community partners and members of the community. That proved valuable when working with both the community partners and the families affected by TB.

The SCDPH did an excellent job of working and communicating with the school system. They have a strong history of partnering together. The collaboration of messaging was further strengthened by including the Sheboygan Area School District (SASD) in the decision making process.

Support staff, such as the receptionists, were able to assist with tasks that helped to streamline the information sharing process.

Areas for Improvement:

As the TB event began to unfold, information sharing mechanisms were inconsistent. Communications were often shared with only those directly involved. Community partner agencies such as the Chamber of Commerce were not made aware of the event until they began to get questions from out of state travelers. Plans need to assure a wider net of communication. The plans should include a procedure for review of including additional outside partners and their contacts as the event changes.

Initially, the lack of cell phones and a communication log presented challenges between public health staff, health care staff and clients. It was often difficult for parties to reach one another. Funding in response to the event provided public health staff with the necessary cell phones

which was found to streamline communication processes.

Communication between health care systems and public health lacked a smooth sharing process. Confusion between public health and health care agencies occurred when sharing of pertinent information such as staff contacts lists/phone trees changed midway through the event. Adherence to ICS by having a health care partner liaison present at Operations meetings may have been helpful. It is important for partner organizations and stakeholders to identify their communication process for the event.

Sheboygan County lacked the capability to initiate conference calling and had to rely on the State or the school system to set calls up. Esponder was not utilized to a large extent.

Target Capability # 9: Medical Material Management & Distribution

Observations:

***Acquiring Medication/ Medication Management*:**

The SCDPH experienced numerous challenges in the early stages of obtaining medications. A conference call with the SCDPH and the Aurora Visiting Nurses Association (VNA) was conducted to seek assistance with obtaining and administering the IV medications and Directly Observed Therapy (DOT). TB medications were provided from several different pharmacies with payment through the State TB Program. As the event unfolded, there were no uniform outlined procedures for pharmacy. Initially, the event experienced shortages of medication. In some cases, only three pills were received in a shipment or deliveries were made to client residences without regard to the isolation status of the home. The lack of written procedures proved challenging when tracking medication from multiple pharmacies, delivery schedules and the different services such as "crushing pills." This also created inconsistent timeframes when reordering medication.

When this outbreak began, the SCDPH had two nurses trained and assigned to active TB case management. Their capacity to provide case management services was quickly exceeded requiring rapid crosstraining of additional nursing staff to assist with case management of the clients. The public health nurse (PHN) case managers worked independently to obtain oral medications for their assigned clients. This included keeping their own logs of incoming medication, storing the medication in a "locked drawer" in their offices and reordering medications as needed. By the end of June, the process began to transition to a more standardized system. The medication was stored in a central location. Client files were also stored in a central locked file cabinet. Medication was repacked daily from bottles into client identified "pill boxes." In late July, medication began to be bubble packed on a trial basis. In August/September, a log was developed to track and inventory medication and identify need to reorder. All client medication was bubble wrapped by a local pharmacy using local funding.

By mid-summer two nurses were assigned to manage the medication process that included

tracking, inventorying, storing and reordering. Unforeseen issues such as medication error and "emergency doses" prompted staff to develop policy and procedures. The Sheboygan TB Event resulted in many newly developed policies, procedures and documents in response to the outbreak (see Appendix C). Another outcome of the event was assigning a support staff person to be a "runner." She was tasked with picking up medications and auxiliary supplies needed to administer DOT medication to the clients. The "runner" position proved to be a valuable asset.

Distribution of Medication/ Directly Observed Therapy (DOT):

Early in the event, the PHN case managers did their own DOT. In May, as case volume increased, additional personnel including PHNs, support staff and LTEs were trained to assist with the DOT process. The case managers and staff assigned to DOT verbally reported to each other in the morning. A DOT Outlook "color coded" calendar was developed to facilitate scheduling and decrease anxiety associated with the DOT process. At this point, policies, procedures and training were developed. Helping to streamline the procedure, the "DOT Communication and Reporting Process" was developed. Clients were also asked to sign DOT agreements. As school began, the case managers worked with school staff to assist in the DOT of the school age clients. The "runner" continued to provide the schools with juice, yogurt and other items that facilitated the ease of taking medication. DOT for the non-school age clients continued with a collaboration of PHNs, support staff and LTEs. Often this necessitated going to the businesses that employed the clients. SCDPH staff worked with both schools and local businesses to accomplish the magnitude of the DOT process while minimizing day to day disruption for clients, schools and buisinesses.

The billing process and sharing of insurance information with the hospitals, clinics and public health was messy. The process lacked a clear understanding by all partners. A changeover of electronic health record and billing procedures occurred at a health care system during the middle of the TB outbreak. This presented additional challenges. As a result information and demographics needed to be corrected before the billing processes could occur. Additional LTEs to assist with the Finance/Accounting areas were hired at Sheboygan County Health and Human Services. Once again, this indicated the necessity to include Finance representatives in the ICS at the onset.

Strength:

The process of identifying two PHNs to manage the medication process proved to be a valuable step in this response. The ability to adjust and make positive changes as the event unfolded spoke to the strength of the public health staff. One of the LTE workers stated "there have been a lot of changes but all are for the better." These changes included developing DOT policies and procedures that included a training process. Whether it was developing the DOT calendar or working to implement DOT in the school or at businesses, staff stepped up to the challenge. All the plans and procedures developed are ineffective if staff is unable to adapt and adjust as

needed. The employees of Sheboygan County proved they can adapt.

Of course, all of this would not be possible without the approval of legislative dollars to assist with the outbreak. An additional asset was an agreement for having State TB Dispensary funding in place on a local level prior to this event. The TB Dispensary reduces financial barriers that can cause delay in having clients obtain necessary physician visits, laboratories and x-rays. The result is greater compliance by the clients.

The Finance branch staff were instrumental in developing documents for requesting payment of such items as client rent, car payments, etc.. The Accounting Department assistance was helpful in streamlining the process. The addition of extra staff dedicated to the TB event were beneficial.

Areas of Improvement:

Despite utilizing the ICS process, there needs to be more clarity in definition of the roles and responsibilities of nurse case managers, and additional cross training of all positions with an emphasis on span of control and communication processes. It was identified, for future events, to establish a "runner" at the onset.

Any just-in-time training for LTEs was fractured at best. This resulted in mixed communications and lack of consistent tasks. Standardized policies and procedures for utilizing mutual aid personnel and LTEs are needed. The process also lacked an orientation procedure as well as identifying supervision of clerical and financial staff LTEs.

The process to obtain medication should be revisited. SCDPH should review their plans and incorporate pharmacy representation as appropriate. Plans should include an algorithm of pharmacies and their services for determing best process for prescription fills.

Identifying other suppliers for the TB medication and working with additional clinics and hospitals to establish TB Dispensary contracts would be beneficial. While the TB Dispensary proved helpful, it lacks clear processes and written procedures related to billing. The financial/billing process is cumbersome with delayed reimbursement, sometimes resulting in clients obtaining notices that their accounts are being referred to collections. Clarity of the process would be useful before expanding the program. SCDPH staff needs to continue working with the Sheboygan County Finance/Accounting staff to finalize draft protocols. Future exercises and trainings should include representation from the Finance/Accounting Departments. They could benefit from a better understanding of their roles and how ICS is effective in managing events.

Target Capability #11: Non-pharmaceutical Interventions

Observations:

The index case was hospitalized early in May. While contact investigation was occurring, some of the SCDPH staff were exposed to active cases before clients were diagnosed with the disease. The index case was identified as having two strains of TB, including one which was resistant to both Rifampin and INH (MDR TB) and a second showing resistance only to INH. Only the INH resistant strain was identified in subsequent family members with active disease. Due to this, it became evident that Index Case needed to be separated from her children and other family members, including those found to also have active disease. Members of this extended family assisted with relocation and care of the young children. The Index Case was transferred to a long term care facility (LTCF) while the county searched for a suitable, separate living location for her. Both the hospital and LTCF enforced a "no visitation" policy. The County leaders and the State TB program staff were supportive of covering family costs for a suitable, separate housing unit for the Index Case in an effort to limit any further disease spread.

The decision to aquire a rental home for the index case proved to be a challenge. A proper ICS chain of command was not utilized. Conflicting criteria was given to multiple persons that were assigned to the task. Because of this, there was a lack of understanding with regard to medical/psychosocial issues of the families. The City/County Purchasing Agent was brought in to assist members of the Logistics team to obtain appropriate housing and furnishings. Late in the event, a Multidisciplinary team was brought together to assist with numerous family issues and concerns.

Sheboygan County went to great lengths to establish comfortable and safe housing for the Index Case. This process included purchasing furniture, appliances, and many household items. They even went to the extent of putting in a small garden for the client. Logistics meetings were conducted to review the process, expenditures such as rent and utilities, and final demobilization of the house.

Various methods were implemented to monitor non-pharmaceutical interventions. At this point in the event, five homes were involved. The homes occupied by the active cases in isolation were marked with signage on the doors with homes of persons in isolation. Sheboygan emergency response services utilized the Computer Aided Dispatch (CAD) system to flag the homes in isolation and prevent any unprotected exposure by emergency responders that could be called to these locations.

After an "active client" presented unannounced at the clinic, an "isolation card" was developed to identify proper Personal Protective Equipment (PPE) precautions. Transportation of the Index case to various physician and laboratory appointments was accommodated via ambulance by the Sheboygan Fire Department. This proved to be a valuable asset that was easily managed by the Sheboygan Fire Department staff.

Strengths:

The City/County Purchasing Agent, having great knowledge of community partners and contacts, was very instrumental in acquiring housing and household supplies. Sheboygan County was willing to seek living accomodations to provide proper isolation to the Index Case and thus prevent community spread. For the most part, the clients adhered to the isolation restrictions. The implemented "voluntary" isolation/quarantine was seen by CDC as a plus in the effectiveness to contain the spread of the disease.

Another strength of the event was that area hospitals and a local long term care facility have isolation or negative pressure rooms available. Representatives of the Sheboygan Police and Fire Departments regularly attended the Planning and Operations meeting. They were able to effectively provide assistance and implement strategies as the event proceded. The partners continued to build on long standing relationships. It also provided an opportunity for education and understanding of TB.

Areas for Improvement:

The need for a Multidisciplinary team should be reviewed at the onset of event. A discharge conference with the team to include case managers, families and medical personal would have been beneficial to the long term improved care. The Multidisciplinary team could have aided Logistics with developing a template for auxiliary resouces such as housing.

As stated earlier, a representative from the health care organizations should be invited for inclusion in planning and operational meetings. Participation at this level could have served as liaison when health care issues arose.

Target Capability #13: Public Health Surveillance & Epidemiological Investigation

Observations:

The SCDPH had two very knowledgable and experienced nurses assigned to case management of TB investigations. SCDPH began contact investigation by focusing on the closest contacts to the Index Case who were members of the family. Family members found to have active disease attended three local schools and worked at three local businesses, potentially infecting hundreds of others in these settings. SCDPH began communications and coordinated joint plans with each of the affected schools and businesses. Early on, communications with the State TB Program was initiated. As the event began to escalate, other nursing staff were brought in to assist. Because they did not have crosstrained staff, the just-in-time training was the best that could be provided and was very stressful to both those teaching as well as those learning. Both TB nurses had different methods of investigation and documentation, resulting in inconsistency.

The SCDPH did not have a central database format or a standardized electronic record system that all could review. To further complicate the event, in mid April, there was a shortage of tuberculin to conduct tuberculin skin tests (TST). TB testing methods were not always consistent, varying between facilities. Client screens were conducted using multiple testing methods including tuberculin skin tests, T-Spot assays or Quantiferon assays, sometimes leading to inconclusive or conflicting results.

As additional nursing staff worked on the investigation, "strike teams" were developed. The Operations Chief continued the role of overall strike team lead, taxing the span of control. The extent of the contact interviews and need for screening/testing was ever growing. It also became apparent not all routine operations would be able to continue. The SCDPH reached out to the statewide public health community for mutual aid.

A neighboring county, Manitowoc, offered to take over some of the SCDPH CD investigations. The State of Wisconsin Surveillance and Outbreak Support (SOS) team assisted with enteric disease investigations. The State of Wisconsin Electronic Disease Surveillance System (WEDSS) allowed for the smooth transition of this task. TB knowledgable public health staff from multiple health departments also provided mutual aid to bridge the gaps. The State TB Program was able to send limited staff to assist as well. As mutual assistance came from other counties, it became evident there was a lack of system wide methods and standards. This also complicated methods of investigation, testing and treatment protocols among health care partners.

Meetings with the State, prompted the State Medical Director to make a formal request for the CDC Epi Aid Team. The Epi Aid Team consists of highly trained personnel that provide technical support for the epidemiological field investigations.

The goals of the Epi Aid Team were:

1. Determine chain of transmission
2. Identify and prioritize contacts
3. Assist with development of data management
4. Make recommendations

A CDC team was on site from late May to early June in an effort to assist SCDPH to assure that early identification of any subsequent cases of TB were identified. CDC staff review of health records at local clinics, hospitals and the SCDPH demonstrated that although rapid response and contact investigation were initiated after report of the Index Case was received, substantial delays in diagnosis had occurred and that it was likely that the Index Case was infectious for many months prior to diagnosis. Due to the long infectious period, it was difficult for the Index Case to recall and provide an accurate list of contacts for contact follow-up. This may have resulted in unidentified persons being infected with risk of disease during the years to come.

The Epi Aid Team developed an Excel spreadsheet tool that incorporated a host of data relating

to the clients. The spreadsheet continued to expand as additional investigations and LTBI related testings were added. As always, the task of updating timely documentation was challenging. Two staff were assigned to maintain the spreadsheet. In late May, T-spot test results from contacts at both school and businesses began to be returned. No new active cases were identified in the school and business settings. A local physician was integral in agreeing to see those clients that did not have a primary physician and required medical evaluation as a result of the screenings. The TB Dispensary provided financial assistance for the numerous laboratory, x-ray and physicians visits required to respond to this event.

Mayo Clinic was identified as the regional source for outside expertise and collaboration. By mid-June several conference calls with Mayo Clinic were held without a clear agreement among Local, State and Regional partners on best treatment regime for those found to have latent infection following exposure to the active cases. The presence of two strains in the Index Case caused delay in identifying an agreement regarding the proper LTBI treatment regime. On June 25, 2013, a child from the extended family was found to have active disease after previously being identified with a latent infection. In mid-July, a local physician, the State TB Program staff and nursing staff of the SCDPH conducted a teleconference to review 41 of the contact cases to make a determination for LTBI treatment.

The SCDPH continued to communicate and educate involved schools and businesses about the need for testing of close contacts. Multiple clinics were organized and conducted for screening of family contacts, school students and their business co-workers. The Sheboygan Fire Department supplied EMT staff to perform phlebotomy at the many testing clinics, often taking place in the late evenings or early mornings. ACL Laboratories partnered in the process as well.

The SCDPH utilized current public health staff, LTEs and community partners to accomplish the DOT for active and LTBI cases. Due to multiple staff involved at the various levels of case management and treatment, it was critical to have good communications.

Strengths:

The SCDPH received “high marks” from the State TB Program and CDC Epi Aid Team for their contact investigation. Much of the investigative work was done before the CDC Epi Aid Team arrived. The Epi Aid Team was valuable in compiling and putting the data into an organized tool. The Epi Aid Tool provided a valuable central location for client specifics such as demographics, testing results and treatment timeline.

The event brought together a wonderful collaboration of staff from Federal, State and Local public health agencies. This collaborative effort carried through to the schools, health care agencies and businesses as well. Grant funding provided cell phones for all public health nurses in the field, something not available prior to this event. This allowed for more efficient communications, including field dictation of client visit records.

SCDPH did a good job of organizing and conducting screening clinics, both at the schools and in the workplaces. They effectively incorporated local and area partners into the process.

Throughout this event, the staff have met on a weekly basis to update and review the situation. Various methods of reporting such as case manager reports, meeting minutes, DOT calendars and client files, have been developed and utilized to ensure accurate documentation and communication with all involved. Physician visits, laboratory testing and case management still continue for all active cases as well as those found to have latent infections as a result of exposures to active cases.

SCDPH staff continue to update the CDC spreadsheet and align the data with WEDSS. While the stressful outbreak overload has been winding down, the work of the event is far from over.

Areas of Improvement:

SCDPH, like many local agencies, has a limited number of staff that are assigned to investigate a TB outbreak. The ability to rapidly train other staff presents a real challenge. This is especially true when the event is targeted to a specific organism that may not be their expertise. The department needs to consider crosstraining staff in the methods of case investigation. The department should do a review of the ICS structure and become familiar with the possible positions individuals may be asked to fill.

The development of strike teams proved to be effective; however, staff would have benefited from implementing them early on. This event was too large to have the same person in the role of Operations Chief and Case Investigation Lead. Much of the feedback from local staff and the Epi Aid Team points to designating an "outbreak response lead." This person would be responsible for coordinating contact investigations, case managers and communications. Staffing constraints led to difficulty in addressing this shortfall and perhaps mutual aid by an experienced PHN from another agency could have assisted in this role.

Although WEDSS was utilized, it was found to be a cumbersome system for documentation of a contact investigation of this size. SCDPH staff also reported that during the contact investigation of the Index Case, she cited "few contacts." Due to the long duration of exposure until identifying the disease, it is impossible to account for all contacts. This incomplete contact investigation could lead to future cases. Again, this reinforces the need for community and health care provider education on the need to "know your TB status."

Target Capability #14: Responder Safety and Health

Observations:

SCDPH had done preplanning to identify the Safety role on their ICS chart. As part of their emergency preparedness, the department was aware of the tasks for this position. At the onset of the event, the Health Officer identified the need for staff safety as a major priority. An update of the SCDPH TB Safety Plan was utilized as a safety guidance plan.

As the event progressed, the Safety Officer developed an ICS 208 – Safety Plan that became the

guidance for the duration of the event. Revisions were made to the Safety Plan to address such issues as service people that may enter the rental home of the Index Case.

Some staff had been exposed to the cases prior to their being identified as having active TB. In mid-August, the health care facilities treating the clients submitted their process for handling known/suspect infectious patients with TB. An update of the isolation status was reported at each Operations briefing. Sheboygan City Police Department attendance at Operations meetings provided the springboard for TB education to the Police Department as well. The Safety Officer shared information with EMS and coroner. An incident occurred at the clinic when an active case, despite receiving isolation instructions, presented at registration without a mask. As a result, an "Isolation Card" was developed for use with isolated clients when seeking necessary health services at health care facilities.

The SCDPH requested additional guidance from the State TB Program to minimize exposure risk of staff via PPE. This guidance led to the purchase of half-face masks such as those used at Heartland TB Center in Texas. Staff that had failed N95 fit testing proved to have a successful fit test with the half face masks. Quantitative testing was offered at the Sheboygan Fire Department by an agreement established just prior to the event.

The event created anxiety among staff in the SCDPH as well as other county employees. Staff that did not fully understand TB or the protection that PPE provides were afraid to make home visits to the clients with TB. Some Health and Human Services staff were fearful of "coming to the health department." As a result, information sessions were conducted for Sheboygan County Health and Human Services staff where public health nurses addressed their concerns. The Employee Assistance Program (EAP) offered programs to assist SCDPH staff and provided on-site private counseling as needed. Employees were encouraged to take lunches and vacations to maintain normalcy and balance. The Health Officer and administration made sure various methods of support were implemented to help alleviate employee concerns.

When one of the health care workers at a local facility was found to have a latent TB infection following exposure to an active case, staff expressed concern about their own exposure risk. After consultation with the State TB Program, staff of the SCDPH went beyond protocol and developed a plan for tracking staff exposure and testing to provide an additional level of comfort. The Sheboygan County Health and Human Service building is undergoing a renovation and this event has emphasized the benefit of having a negative pressure room.

Strengths:

This event highlighted the coordination efforts of the Sheboygan Fire Department, SCDPH and Emergency Management to develop a strong safety plan. The ability of the Sheboygan Fire Department to do the quantitative fit testing was a tremendous time saver. The quantitative testing also provided a greater sense of security related to exposure risk. Besides educating the Sheboygan Police Department about TB, they fit tested officers and put a half face mask in each squad car.

The isolation signage at all the residences, as well as the "no visitation" order imposed on the

Index Case while hospitalized and when residing at the LTCF provided additional staff and community wide protection.

Areas of Improvement:

While issues were addressed, staff complaints and concerns were still being expressed. Clear, concise and consistent training plans should be made available for wide distribution throughout the State of Wisconsin. Consistent training plans would improve the ability of local health department staff to utilize neighboring health department staff and LTEs via mutual aid in the event of an outbreak. TB education should emphasize how the disease is transmitted and steps to maximize worker safety. Plans should also consider including efforts to boost employee morale and alleviate stress. This event emphasized the need to review policies and procedures related to Responder Safety and Health.

Demobilization:

The demobilization of the Index Case's rental house prompted the Logistics Chief to have meetings to formalize the process. The City/County Purchasing Agent had developed an inventory list of all the items and services related to the establishment of the rental house.

The final meeting reviewed:

- Outcome of purchased household items
- Moving Index Case – back to apartment
- Ventilation of house
- Final cleaning of house
- Termination of services

Although members of the SCDPH had participated in numerous exercises over the past years, this was the first formal demobilization of a process utilized during the event. As a result, the ICS 221 form was utilized.

SECTION 3: CONCLUSION

The Sheboygan County TB Event has been deemed an overall success. The event demonstrated the value of forming and continuing to have good working relationships with partner agencies and the community. Throughout this entire event, the SCDPH demonstrated an ability to adapt and adjust to change.

In summary, the Capabilities targeted for this event demonstrated the following:

Emergency Operations Coordination:

This event was strengthened by the foresight of the SCDPH to provide staff with the necessary plans, trainings and exercises that reinforces Emergency Preparedness and the ICS. While specifics of the ICS need to be reviewed and revised, the basic knowledge was valuable. The strong partnerships from all levels of the Sheboygan City/County government from department agency heads to the elected officials were invalable. Finally, a knowledgeable staff was the greatest identified resource and essential to the success of this event. SCDPH reached out to all staff to effectively meet the objective. Whether their job was in reception, support staffing or Maternal Child Health (MCH) nursing, all were called upon to assist.

This event demonstrated the need to include representatives of Finance in all aspects of this event, including prior trainings and exercises. The need to include various partners and stakeholders, such as health care, should be continually reviewed. This event saw the "span of control" overtaxed. The need to reinforce this at future staff trainings and during actual events was a lesson learned.

Public Information and Warning:

While this capability is often a problem in many events, the Sheboygan County TB Event demonstrated how to successfully execute information to the public. The key was well trained and knowledgeable staff that designed and implemented good message mapping. The strong working relationships, especially with the schools, were also valuable in this area. A lesson learned was to continue to review and revise the message audiences receive as the event evolves.

Information Sharing:

The sharing of information was challenging due to the complexities of the situation and the extensive array of partners that had a stake in the event. A strong base of good working relationships with the health care partners and schools helped to implement the sharing of information via previously established methods.

A major area of suggested improvement would be for Sheboygan County to expand capacity to conduct conference calls via their own phone system without relying on State or other local agencies to coordinate the calls. This was identified as a hindrance to effective information sharing.

Medical Material & Distribution:

This capability presented numerous challenges of acquiring, inventorying, managing and distributing medication. At the onset of the event, this entire process was done individually by case managers. The SCDPH rapidly developed a centralized and standard process to execute all aspects of this.

The eventual assignment of a two person team to oversee this process proved to be an effective lesson learned. Staff developed standardized procedures and tracking methods that can be utilized for other events. Plans however need to be revised to incorporate a pharmacy representative into the process. The staff of SCDPH, along with Finance, needs to continue to create policy and procedures in conjuction with local clinics and hosptials to streamline the billing/payment processes of TB Dispensary related services.

Non-Pharmaceutical Interventions:

The ability to implement isolation early on in the event was instrumental in preventing further spread of the disease. The need for isolation policies were put into place by health care partners as well.

Midway in the event, a Multidisciplinary team was developed to address the social, cultural and economic challenges. The task to obtain one rental house required much time and effort from staff. Sheboygan County Health and Human Services needs to evaluate how this task could be expanded if multiple housing units would be required in the future.

The Sheboygan County Health and Human Services should develop procedures for a Multidisciplinary team that addresses all aspects of the effected client, including housing. Preplanning should determine who needs to participate on the team.

Surveillance and Epidemiology:

This capability demonstrates that "what public health is charged with – they do well." Their field of expertise is case investigation and the SCDPH proved to all that they successfully executed this. The public health system is currently staffed with many veteran professionals who were called upon to assist.

The lack of cross trained staff and standardized procedures caused the process to be challenging at best. This is not a task that can be easily accomplished through just-in-time training.

A need to systematically address ICS span of control throughout the event was evident during and following the event. As an event escalates, staff may need to change their roles and responsibilities. No one person should have a span of control beyond 3-7 persons or attempt to manage it all.

Responder Safety and Health:

This event brought together outside agencies such as fire and police to successfully address the safety of all those responding. The ability of the Sheboygan Fire Department to provide fit testing saved time and fostered a message that employee safety was important. Collaboration to educate partners and employees is critical to any success. This event has demonstrated the need to review policies and procedures that address all aspects of the employee well-being.

The Sheboygan County TB Event was large enough to tax the system but allow the local responders to be "in charge." As the Emergency Management Director pointed out in an interview, "I never expected TB to be one of the bigger events I'd face when I got into emergency management." The table below demonstrates a sample of some of the volume of time and tasks that it took to respond to this event.

	# of Clients treated in Sheboygan County as part of 2013 TB Outbreak	Average Months Treatment/Client	Total Doses of treatment
Clients with Active TB Disease	10	8.4	2550
Clients with TB Infection (LTBI)	30	5.1	4800
Clients treated for disease or infection	40*	5.9	7350
Number Community Members Screened		670	

*One to be treated post-pregnancy.

The Index Case presented at several health care facilities with respiratory problems at least a year prior to being diagnosed in April of 2013. Due to the span of time that existed during a period of infectivity, the ability to obtain a complete list of contacts was unrealistic at best. This could have long term implications. While many lessons were learned throughout the outbreak, it also became increasingly apparent that the Sheboygan County TB Event demonstrated a need for a comprehensive TB awareness campaign in the community, meeting the distinct needs of health care providers and community members at-risk for tuberculosis. The prior years of planning, training and exercising the SCDPH did were invaluable to the success of this outcome. They have exhibited a great foundation to continue to build on!

SHEBOYGAN COUNTY TB EVENT: IMPROVEMENT PLAN

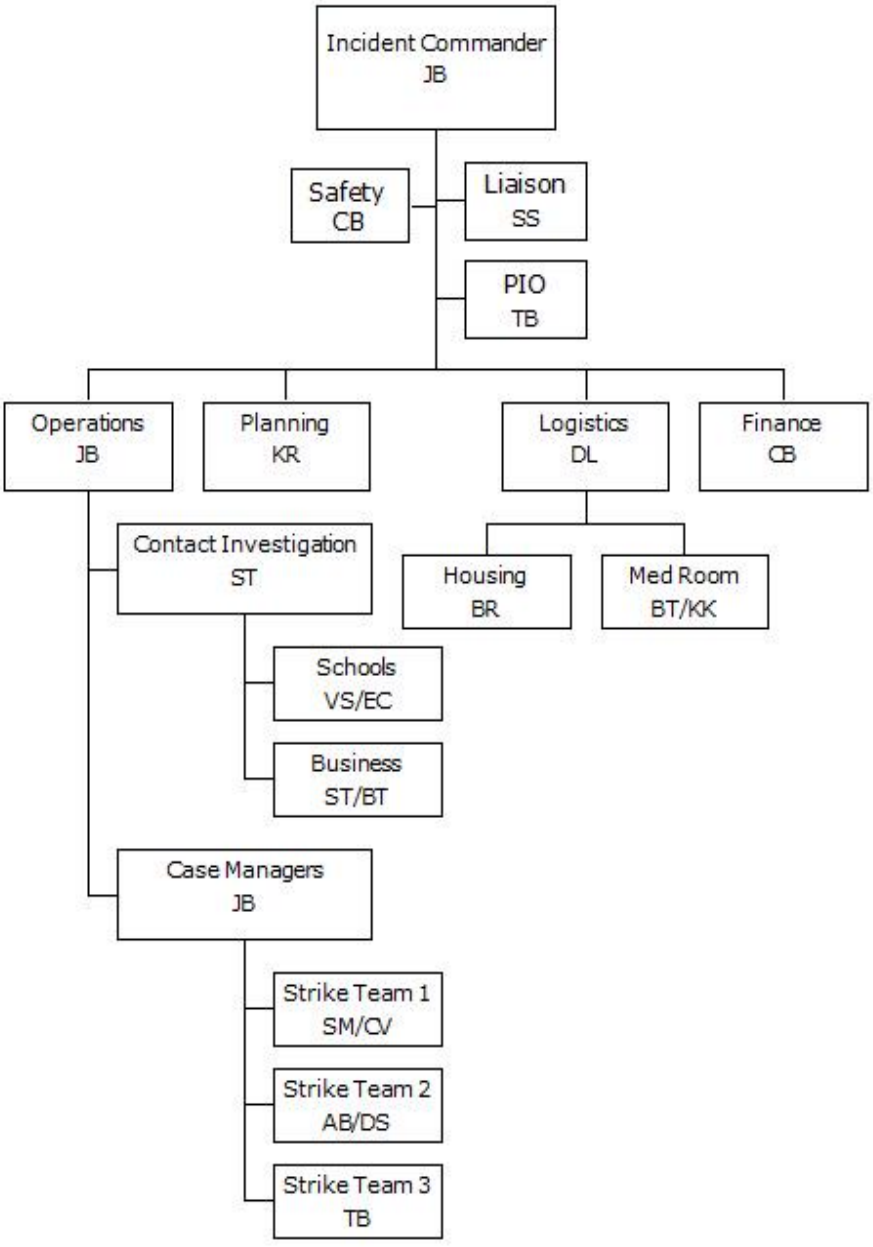
This IP has been developed specifically for Sheboygan County as a result of the real TB Event that occurred April – Dec 2013.

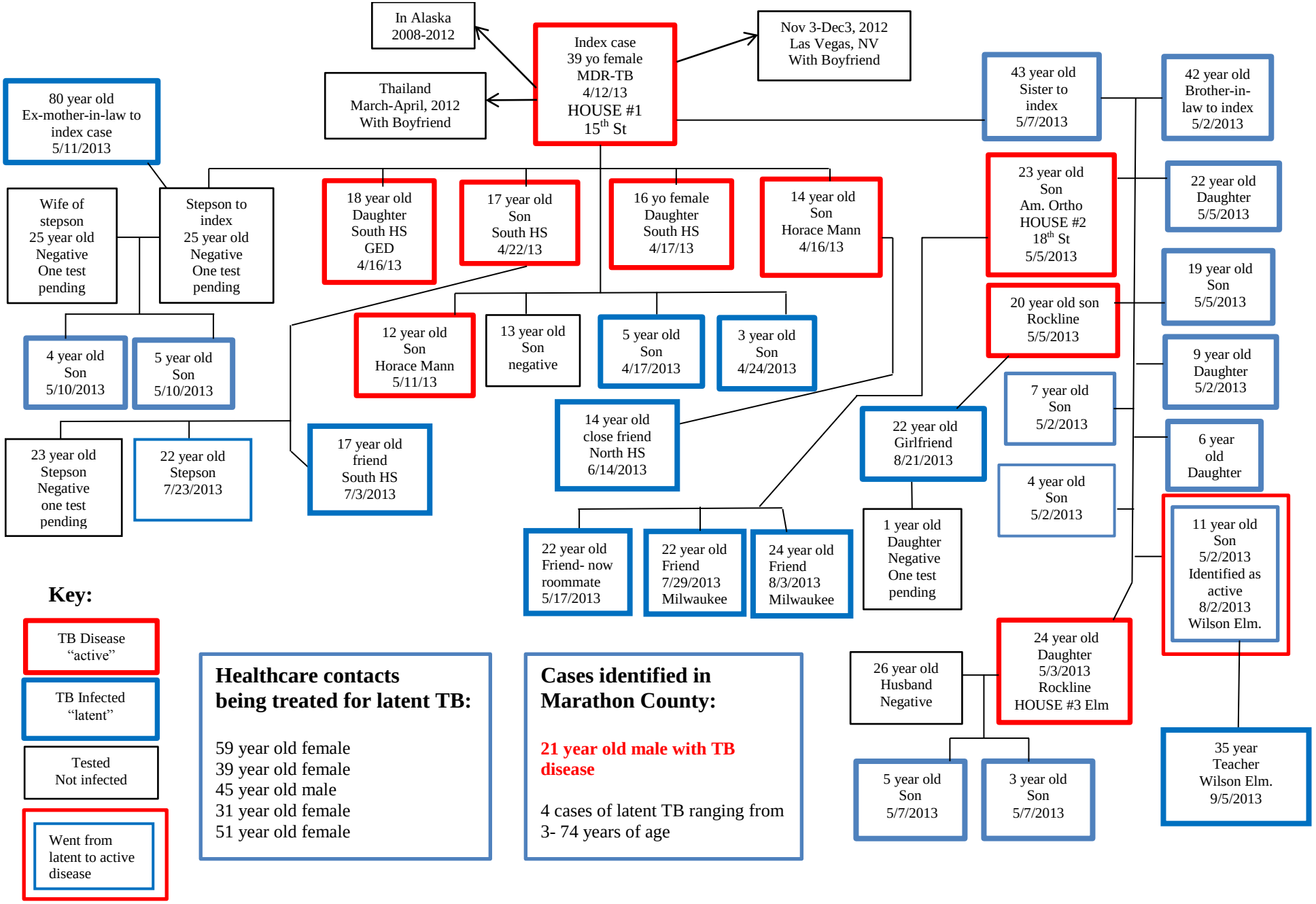
Target Capability	Issue/Area for Improvement	Corrective Action	Primary Responsible Organization	Start Date	Completion Date
Capability #3: EOC	1. Need of all staff to understand ICS roles/responsibilities	Staff training refresher to be provided	DPH	Spring 2014	Fall 2014
	2. Need to include Finance in trainings/exercises	Will invite Finance personnel to Functional Needs Exercise	DPH/EM	5/5/14	5/5/14
	3. Review healthcare partner liaison role in the EOC/Event	Will address during AAR report with key healthcare partners	DPH	5/14/14	TBD
# 4: PIO	1. Review (PIO) process/update	Will review & update PIO Target Capability Section within the PHEP	DPH	Summer 2014	Fall 2014
	2. Identify a backup PIO • within the PH • at the County level.	DPH has identified a backup PIO and will provide training Will address county level PIO at 5/5/14 Functional Exercise	DPH EM/HHS	In process	Fall 2014
#6: Information Sharing	Review Information Sharing Plans to assess: • As event evolves • Phone trees • Communication logs	Review and revise the Information Sharing Target Capability Section of the PHEP	DPH	In process	Fall 2014
	Review ability to obtain conference call capabilities	To explore & develop conference call capabilities	EM/ HHS	Spring 2014	TBD

#9: Medical Material Management and Distribution	1. Develop plans for LTE orientation/ training	Will develop department system for orientation / training Will advocate for Statewide standards to include TB medications/ distribution	DPH	Spring 2014	TBD
	2. Include Pharmacy into planning: develop algorithm of pharmacies & service/identify other suppliers	Will work with pharmacies to update local protocols Will reach out to the State TB Program to address Statewide/ regional procedures	DPH	Ongoing	Local DPH plans – Fall 2014
	3. Consider expanding TB Dispensary to other healthcare organizations	Ongoing process at local DPH level. Will advocate for expanded standard billing procedures, etc. at State level	DPH	In process	TBD
	4. Develop & review finance/accounting protocols	Ongoing process at local DPH level. Will advocate for Statewide approach addressing financial burden of local outbreaks.	DPH	In process	TBD
#11: Non-Pharmaceutical Interventions	1. Determine need for a Multidisciplinary Team/identify members	Will work to identify team members/ procedures Will revise PHEP as needed	DPH	In process	TBD
#13: Public Health Surveillance & Epi Investigations	1. Cross train staff in case investigation	Currently revamping internal protocols/ adjusting assignments Will advocate for Regional standards/ protocols/documentation to strengthen response	DPH	In process	Fall 2014
	2. Review Operations Section of ICS/develop procedure to address Outbreak Lead	Will develop procedure for activating Strike Teams/identifying a “Lead” Will update the PHEP	DPH	Spring 2014	Fall 2014
	3. Establish Community TB Education	TB Community Education Workgroup has been developed In process of meeting with healthcare	DPH	Ongoing	TBD

		partners to address TB education. To partner with State TB Education efforts.			
#14: Responder Safety and Health	Review safety plans to include monitoring / provide guidance for staff mental health	Will review and revise the PHEP to reflect updates from the TB Event. Include procedure/protocol for mental health issues incorporating EAP and other methods.	DPH	Ongoing	Fall 2014

Appendix A: Incident Command Structure (ICS)





Map of Cases Related to the 2013 TB Outbreak

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Appendix C: List of Documents Developed during TB Event

Case Management documents
Directly Observed Therapy (DOT) Checklist for Orientation to DOT Process
Sheboygan TB Incident Daily Directly Observed Therapy (DOT) Staff Orientation
DOT Communication and Reporting Process
Reporting Form – Case Managers to DOT Workers
DOT Outlook Calendars – process
Sheboygan County Active Direct Observed Therapy (DOT) Agreement
Sheboygan County Latent Tuberculosis (LTBI) Treatment Agreement
Sheboygan County TB Incident – Statistical Information of LTBI Cases
Follow-up Assignments Log (for LTBI Case Treatment)
Limited Term Employee (LTE) Orientation Checklist
Laminated Card for Client "Precaution" ID at Healthcare Facilities
Chart Review form for Wisconsin TB Outbreak Investigation
Request Form: Items to be scanned
Staff TB testing after contact w/ patient (algorithm)
Follow Up Process – TB cases/ LTBI Contacts

Schools
TB Medication Administration in Schools – procedure
Children receiving TB Meds in the SASD – lists: nurse case mg/child/ name of medication/ dosage
SASD School Nurse Assignment
SASD TB Medications
In school order sheet – for supplies

Finance Documents
Sheboygan County Procedures for Record Keeping, Payment of Bills and State Reporting for TB related Incidents
Sheboygan County Form for Client External Expenses for TB
Sheboygan County Purchase Authorization or Purchase Order Form for TB Services
Sheboygan County Listing of Allowable Costs for TB
Sheboygan County Plan – Clients out of Isolation Questionnaire
Medication
Repacking of TB Medications
Tuberculosis Drug Inventory
TB Drug Tracking Record
Glanders Pharmacy Routing Form (excel spreadsheet)
Ganders Bubble Packing Order

Other
Index Case House – Inventory List & Covered Utilities/ Services
Employee Contact Investigation (spreadsheet)

Appendix D: Abbreviations and Acronyms

AAR	After Action Report
CAD	Computer Aided Dispatch
CDC	Centers for Disease Control and Prevention
DOT	Direct Observed Therapy
EOC	Emergency Operations Center
Epi – Aid	Epidemiology – Aid
IAP	Incident Action Plan
ICS	Incident Command System
IMT	Incident Management Team
INH	Isoniazid (TB drug treatment)
IP	Improvement Plan
JAS	Job Action Sheet
LTBI	Latent Tuberculosis Infection
LTE	Limited Term Employee
MDR-TB	Multi Drug Resistant – TB
NACCHO	National Association of City and County Health Officials
NPR	National Public Radio
PHN	Public Health Nurse
PIO	Public Information Officer
PPE	Personnel Protection Equipment
SASD	Sheboygan Area School District
SCDPH	Sheboygan County Division of Public Health
TB	Tuberculosis
VNA	Visiting Nurse Association
WEDSS	Wisconsin Electronic Disease Surveillance System
WSLH	Wisconsin State Laboratory of Hygiene